JOY GOLDSCHMIDT
JACK J. GRYNBERG

IBLA 87-78, 87-143, 87-171 Decided February 21, 1989

Appeal from decisions of the Wyoming State Office, Bureau of Land Management, increasing the annual rental for noncompetitive oil and gas leases. W-83114, W-85742, W-82078.

Affirmed.

1. Oil and Gas Leases: Burden of Proof--Oil and Gas Leases: Known Geologic Structure

   Delineation of a KGS recognizes the existence of a continuous entrapping structure, on some part of which there is production, or of numerous related, but nevertheless independent, stratigraphic or structural traps. A party challenging a determination that lands are within a KGS must either show that the producing structure does not underlie the land or affirmatively establish that the land involved is not productive from the structure in question. A determination by a Departmental technical expert that lands qualify for inclusion in a KGS will be upheld when it is not arbitrary and capricious and is supported by competent evidence.

2. Oil and Gas Leases: Known Geologic Structure

   The fact that the boundaries for this portion of the KGS were established based upon data from a limited number of wells does not mean that BLM erred in relying upon the information. Regardless of whether the available information is sparse or abundant, when a KGS determination is challenged, the relevant questions concern the reasonableness of the inferences which have been made based upon the data and the extent to which BLM's conclusions concerning the geologic structure are supported or contradicted by the available data.

3. Oil and Gas Leases: Known Geologic Structure

   The determination that land is within a KGS does not guarantee that the entire area is productive; it only shows that on the basis of geological evidence the Department has determined there is a structure in which

oil or gas is trapped and there is production from a well on that structure. So long as there is production, BLM is not restricted as to which formations it may select as the basis for defining a KGS.

4. Oil and Gas Leases: Known Geologic Structure

Land is included in the KGS on the basis of geologic evidence indicating that the structure underlies the land, not on the basis of evidence that oil and gas is contained in that portion of the structure which underlies the land. Consequently, the fact that land within the KGS is later found not to be productive does not mean that it was improperly included or that the criteria for its inclusion were deficient.

APPEARANCES: Joy Goldschmidt, Rosemont, Illinois, and Jack J. Grynberg, Denver, Colorado, pro sese; Lowell L. Madsen, Esq., Office of the Regional Solicitor, U.S. Department of the Interior, Denver, Colorado, for the Bureau of Land Management.

OPINION BY ADMINISTRATIVE JUDGE IRWIN

Joy Goldschmidt and Jack J. Grynberg have appealed three decisions of the Wyoming State Office, Bureau of Land Management (BLM), dated September 18 and November 7, 1986, which increased the annual rental for their noncompetitive, nonproducing oil and gas leases (W-83114, W-85742, W-82078). 1/ In each case the effect of BLM's decision is to increase the annual rental rate from $1 per acre to $2 per acre for one or more lease years through the fifth lease year. We have consolidated the appeals because of the geographical proximity of the leased lands and because the parties have raised similar arguments in their statements of reasons.

The basis for BLM's decision was a determination that the leased lands are within the Washakie Basin Known Geologic Structure (KGS). The Washakie

1/ Oil and gas lease W-83114 for 1,280 acres, consisting of the NW\ sec. 8, sec. 22, and the E\ sec. 25, T. 25 N., R. 94 W., sixth principal meridian, Sweetwater County, Wyoming, was issued to Joy Goldschmidt with an effective date of Apr. 1, 1983. Oil and gas lease W-85742, held by Jack J. Grynberg, was issued with an effective date of Mar. 1, 1984, for 160 acres, consisting of the S\ S\ sec. 25, T. 25 N., R. 95 W., sixth principal meridian, Sweetwater County, Wyoming. Oil and gas lease W-82078 was issued to Joy Goldschmidt for 320 acres, consisting of the S\ S\ sec. 10 and the SW^ sec. 12, T. 25 N., R. 95 W., sixth principal meridian, Sweetwater County, Wyoming, with an effective date of Jan. 1, 1983.

Basin KGS is an extremely large stratigraphic KGS which includes portions of approximately 50 townships in the Washakie and Great Divide Basins of Sweetwater and Carbon Counties, Wyoming. Appellants' oil and gas leases are near or on the northwestern boundary of the KGS.

[1] A KGS is defined as "technically the trap in which an accumulation of oil and gas has been discovered by drilling and determined to be productive, the limits of which include all acreage that is presumptively productive." 43 CFR 3100.0-5(l). Delineation of a KGS recognizes the existence of a continuous entrapping structure, on some part of which there is production, or of numerous related, but nevertheless independent, stratigraphic, as well as structural, traps. Thunderbird Oil Corp., 91 IBLA 195, 202 (1986), aff'd sub nom., Planet Corp. v. Hodel, Civ. No. 86-679 HB (D.N.M. May 6, 1987).

An appellant challenging a KGS determination must either show that the producing structure does not underlie the land or affirmatively establish that the land involved is not productive from the structure in question. Id. The law is settled that a party challenging a BLM determination that lands are within a KGS has the burden of establishing by a preponderance of the evidence that inclusion of the land is erroneous. Bender v. Clark, 744 F.2d 1424, 1429-30 (10th Cir. 1984); Carolyn J. McCutchin, 103 IBLA 1 (1988); Thunderbird Oil Corp., supra at 201.

The Secretary of the Interior has delegated the responsibility for determining the existence and extent of KGS's to his technical experts in the field. When these experts make a determination that lands qualify for inclusion in a KGS, the Secretary is entitled to rely upon their reasoned opinion. Thunderbird Oil Corp., supra at 202; Champlin Petroleum Co., 86 IBLA 37, 40 (1985). A determination by a Departmental technical expert will be upheld when it is not arbitrary and capricious and is supported by competent evidence. Thunderbird Oil Corp., supra; Lowell J. Simons, 104 IBLA 129, 131 (1988).

Each of the three statements of reasons filed by appellants contains six to eight numbered arguments directed toward showing error in BLM's determination that the leased lands are properly located within the KGS. We note, however, that many of the arguments appearing in each statement of reasons either repeat almost verbatim arguments raised in the other statements of reasons or are substantially similar to arguments set forth in the other statements of reasons. For this reason we will not separately address each argument raised, but rather group them according to the points they seek to establish.

The first arguments with which we are concerned are those which assert that BLM lacked sufficient data to have made an accurate or reasonable

determination of the extent of the upper Almond formation. 2/ Appellants state that within the area encompassing several townships in the vicinity of their leases only four wells have been drilled which reached the Mesa Verde formation (the top of which is the Almond) and only one is a producing well. Appellants argue that, given the size of the area, the number of wells is insufficient to permit a reasonable interpretation of the actual configuration of the Almond formation.

More particularly, appellants argue that the density of wells drilled in the area is too sparse to support a conclusion that the formation extends eastward from the producing Yates Osborne Draw Federal #1 in sec. 4, T. 25 N., R. 95 W., to the area of their leases. They note that the nearby Hay Creek field, which has been extensively drilled, clearly has a north-south trend, and they contend that the depositional trend is probably north-south throughout the entire area. In support of their position, appellants refer to exhibits reproducing portions of well logs for the Yates well and the nonproducing Texas Oil and Gas (TXO) #1 Eagle Springs well in sec. 27, T. 25 N., R. 94 W. (Exh. III, IBLA 87-78). Appellants assert that there is no correlation between the two well logs and conclude that the producing horizon for the Yates well does not extend eastward to the area of their leases.

BLM's answer to each statement of reasons includes a "geological report" addressing appellants' arguments. In its report BLM agrees that in the portion of the Washakie Basin KGS depicted on the map submitted by appellants (Exh. I, IBLA 87-78) only four wells penetrated the Almond formation. However, BLM notes that "all four wells have crossover on the CNL/FDC log, indicating free gas." BLM additionally states that the northern portion of the Washakie Basin KGS actually contains 19 wells which were completed in the Almond formation and 7 other wells which were drilled below the Almond.

In response to the appellants' more specific argument, BLM states that its interpretation of the available data is that the area is the "delta lobe terminus" (or "finger terminus") of the upper Almond formation, although the Bureau acknowledges that data from future drilling could show the formation to trend more north-south. BLM claims that the difference between the Yates and TXO wells can be accounted for by differences in the thickness, shaliness, and reservoir quality of the depositional sequence of the upper Almond and by the different positions of the two wells on the center and edge of the delta bar. BLM also notes that the log comparison on which appellants base their argument as to lack of correlation between the two wells has the top of the Mesa Verde incorrectly marked by a difference of 30 feet.

2/ Statement of Reasons for IBLA 87-78, argument 1; Statement of Reasons for IBLA 87-143, argument 1; Statement of Reasons for IBLA 87-171, arguments 1 and 2.

[2] Although appellants correctly point out that well data for the area is limited, their argument is not persuasive because it fails to point to any error in BLM's interpretation of the data which was available. The fact that the boundaries for this portion of the KGS were established based upon data from a limited number of wells does not mean that BLM erred in relying upon the information. The task of defining the extent of a KGS is inherently one requiring use of limited data. Only a limited number of wells will have been drilled in an area, and only a limited number will have reached or penetrated any particular formation. Regardless of whether the available information is sparse or abundant, when a KGS determination is challenged, the relevant questions concern the reasonableness of the inferences which have been made based upon the data and the extent to which BLM's conclusions concerning the geologic structure are supported or contradicted by the available data.

In the present case, BLM appears to have determined the extent of the KGS based upon not simply the 4 wells noted by appellants but also 26 others outside the immediate area of appellants' leases. Although the record before the Board does not contain data from these wells, appellants' arguments do not suggest that BLM made unreasonable inferences in deciding that the Almond formation underlies the leased land. Appellants' argument that there is no correlation between the Yates and TXO wells does suggest that BLM's conclusions about the extent of the upper Almond formation are contradicted by relevant data. However, as BLM notes, the top of the Mesa Verde has been incorrectly marked on appellants' exhibit which reproduces the well logs. Due to this error, we cannot give any weight to appellants' claim that there is no correlation between the well logs.

Appellants also argue that BLM was inconsistent in choosing the basis for establishing the Washakie Basin KGS. 3/ In particular, appellants note that, while the KGS report prepared by the Rock Springs District Office described the Almond formation as "shale encased, laterally discontinuous sands," and used the Ericson formation to define the area of presumptive productivity, the Rawlins District Office regarded the continuity of the upper Almond sandstone as "much more extensive than the literature would suggest" and based its KGS determination on the formation (Exhs. VI and VII, IBLA 87-78). Similarly, appellants argue that the report for the Rawlins office inconsistently states that the upper Almond formation both has more extensive continuity than previously thought and is discontinuous.

Although these arguments accurately represent the BLM documents appellants rely upon, neither point has merit. Both arguments contrast statements that the Almond formation is discontinuous with statements about its continuity. However, as indicated by BLM in its geologic report, the concept of continuity under consideration is not absolute but a matter of

3/ Statement of Reasons for IBLA 87-78, arguments 3 and 4; Statement of Reasons for IBLA 87-143, arguments 4 and 5.

degree. "All sand bodies are discontinuous, but sand bars are laterally more discontinuous than blanket sand deposits." The geologic report also provides the citation for the "literature" referred to in the KGS report. That source had described the upper Almond as composed of sandstone bodies 2 to 4 miles wide, 5 to 40 miles long, and up to 40 feet thick. 4/ Thus, the Rock Springs office regarded the Almond formation as discontinuous in the sense that it occurs as a separated rather than a continuous deposit. On the other hand, the Rawlins office concluded that the sandstone bodies which constitute the formation are longer and wider than previously reported, and, in this sense, found the Almond formation to have greater continuity.

[3] Nor is there any inconsistency in the fact the Ericson formation was used to expand the Washakie Basin KGS to the south, while the upper Almond was used for the northern portion of the KGS. As the Board has stated for many years: "The determination that land is within a KGS does not guarantee that the entire area is productive; it only shows that on the basis of geological evidence the Department has determined there is a structure in which oil or gas is trapped and there is production from a well on that structure." William T. Alexander, 21 IBLA 56, 61 (1975). So long as there is production, BLM is not restricted as to which formations it may select as the basis for defining a KGS. Nor would any useful purpose be served by limiting a KGS to a single formation. In the present case such a limitation would simply require BLM to draw additional boundary lines and assign separate names to the northern and southern portions of the KGS. Some areas might be determined to be underlain by both formations, and so would be included in overlapping KGS's, but the total area included would not be less as a result of basing each KGS on a single formation. Regardless of whatever may eventually be learned about the actual extent and continuity of the upper Almond, neither of appellants' arguments suggests that BLM erred in determining that the formation underlies the lands they lease.

A third group of appellants' arguments are framed as challenges to the "parameters" used by BLM to establish the boundaries of the KGS. 5/ As stated in the KGS report by the Rawlins district office, the boundary of the KGS is defined by "the zero footage isopachous line drawn on the upper Almond sandstone where its density porosity is a minimum of 6% and where its resistivity (RT) is greater than 15 ohm/meters" (Exhibit VI, IBLA 87-78 at 4). Appellants contend that these criteria are inadequate to accurately define the areas where oil and gas are likely to be present.

4/ L. A. McPeek, "Eastern Green River Basin: A Developing Giant Gas Supply from Deep, Overpressured Upper Cretaceous Sandstones," Bulletin of the American Association of Petroleum Geologists, vol. 65-6 at 1085 (1981).

5/ Statement of Reasons for IBLA 87-78, arguments 2, 5, and 6; Statement of Reasons for IBLA 87-143, arguments 2, 3, 6, and 7; Statement of Reasons for IBLA 87-171, arguments 3, 5, 6, and 7.

One argument challenges the minimum resistivity of 15 ohm/meters as too low to accurately indicate the gas bearing zones of the upper Almond formation. Appellants argue that the resistivity level should be set much higher because areas of 15 ohm resistivity are likely to be water bearing. Appellants support their argument by noting that well logs show the producing zones of the Yates well to have an average resistivity of approximately 110 ohms, while the nonproducing TXO well has an average resistivity of about 40 ohms in the area of the Almond formation. Appellants further note that the nonproducing Apache Corporation #1-20 Federal well in sec. 20, T. 25 N., R. 95 W., averages about 20 ohms in the upper Almond formation. Based on these facts, appellants conclude that the gas bearing zones of the Almond formation in the area of the leases have "resistivities much higher than the 15 ohm cut-off and significantly higher than the two nearby dry holes * * * which obviously is one reason why they are non-productive."

Appellants additionally attack the criteria as deficient because areas included within the KGS are inconsistent with the results which have been obtained from drilling. In regard to the Apache and TXO wells, appellants note that BLM's isopach map assigns 20 feet of "net pay" to each well even though both wells were dry holes. Appellants suggest that BLM apparently regards these wells as "by-passed producers" drilled by incompetent industry personnel.

Similarly, appellants note that, while the Hay Reservoir and Bush Lake areas are included within the KGS as presumptively productive, of the numerous wells which were drilled to the upper Almond, completion attempts were made for relatively few and only a small percentage of these were successful. Appellants believe that the relatively low success ratio indicates that BLM's standards for designating the areas included in the KGS are inherently flawed. In this regard they note that many of the unsuccessful wells are shown on the isopach map for the KGS to overlie a considerable thickness of the upper Almond "reservoir."

Appellants arguments are flawed in that they misconstrue the nature of a KGS determination and, consequently, the function of the criteria selected by BLM for determining the areas included within the KGS. As has been frequently stated in Board decisions:

> It is important to keep in mind that if BLM includes land in a KGS it does not necessarily mean that the land is currently producing or conclusively known to be productive of oil or gas. When BLM includes land in a KGS, it does not predict future productivity. Land may properly be included in a KGS based upon geologic evidence indicating that a producing deposit extends under the land such that the land is considered to be "presumptively productive."

Sherbourne Partnership, 90 IBLA 130, 133 (1985); see Angelina Holly Corp., 70 IBLA 294, 299 (1983), aff'd, 587 F. Supp 1152 (D.D.C. 1984); Vernon &

Rita Benson, 48 IBLA 64, 68 (1980). Lands are included within a KGS because they meet the criteria established by BLM based on portions of the structure from which production has been obtained. In the present case, BLM notes that the 15 ohm cutoff "was based on the lowest resistivity found with production within the whole Washakie Basin KGS." Thus, while land which meets the criteria may be productive, and can properly be included within the KGS as presumptively productive, the fact that land meets the criteria does not mean that it necessarily will be productive.

[4] Appellants, however, assume that BLM's purpose in selecting criteria to define acreage as presumptively productive is to accurately predict the areas where oil or gas will be found. Because appellants regard the KGS designation as essentially predictive, they construe the fact that "dry holes" have been drilled within the KGS to indicate that the criteria are deficient. Appellants are mistaken in their assumption. The criteria are selected to describe the structure in which oil or gas has been found, not to predict where it will be found. Land is included in the KGS on the basis of geologic evidence indicating that the structure described by the criteria underlies the land, not on the basis of evidence that oil or gas is contained in that portion of the structure which underlies the land. Consequently, the fact that land within the KGS is later found not to be productive does not mean that it was improperly included or that the criteria were deficient.

Likewise, the fact that a "dry hole" is found within the area included in a KGS does not, ipso facto, establish that it was error to include the area within the KGS. There are a variety of reasons a well may be deemed a "dry hole" incapable of production in paying quantities. Some involve economic considerations which are not relevant to the question of whether the land is properly included within a KGS. See Beard Oil Co., 99 IBLA 40, 47 (1987). Error will be shown, however, if data from the well establishes that the structure does not underlie the land, that the structure underlying the land does not meet the criteria based on which the land was included in the KGS, or that the structure underlying the land does not contain and cannot produce oil or gas. Thunderbird Oil Corp., supra at 202. In the present case appellants have not shown that such is the case.

Finally, appellant Goldschmidt argues that inclusion of the acreage within the KGS is a violation of the contractual provisions of the lease. This is not so. Section 2(d) of each of appellants' leases provides for the payment of annual rental "at the following rates":

> (a) If the lands are wholly outside the known geologic structure of a producing oil or gas field:
>
> (i) For each lease year a rental of $1.00 per acre or fraction of an acre.
>
> (ii) Beginning [the] 6th year, $3 per acre or fraction thereof.

(b) If the lands are wholly or partly within the known geologic structure of a producing oil or gas field:

(i) Beginning with the first lease year after 30 days' notice that all or part of the land is included in such a structure and for each year thereafter, prior to a discovery of oil or gas on the lands leased, $2 per acre or fraction of an acre.

The leases anticipate that BLM may later determine that the leased land is within a KGS, and they provide that, upon notice to the lessees, BLM may increase the rental as provided by the lease terms. BLM's decisions now under appeal gave appellants such notice. The factual basis for the determination that the land is included in the KGS has been challenged in the appeal. The issuance of the decisions was not contrary to the terms of the leases.

Accordingly, pursuant to the authority delegated to the Board of Land Appeals by the Secretary of the Interior, 43 CFR 4.1, the decisions of the Wyoming State Office are affirmed. 6/

Will A. Irwin
Administrative Judge

I concur:

Wm. Philip Horton
Chief Administrative Judge

6/ Although we affirm the decisions appealed from, we note that the boundaries of the KGS were improperly located insofar as they include each 640 acre section touched by the zero contour line shown on the isopach map for the KGS. In Pamela S. Crocker-Davis, 94 IBLA 328, 332 (1986), the Board concluded that, absent some justification to show the relation between state established spacing units and the concept of a KGS, BLM should include in a KGS only the smallest legal subdivision (quarter quarter section) traversed by the boundary of the structural or stratigraphic trap. Accord Cleleste C. Grynberg, 106 IBLA 219, 222 (1988); Charles J. Rydzewski, 105 IBLA 9 (1988); Ecological Engineering Systems, 104 IBLA 117, 121 (1988). Absent a justification showing that the spacing unit implies the presence of hydrocarbons, use of state spacing units to determine the boundaries of a KGS would appear to be based on administrative convenience rather than geologic information. Kathleen M. Blake, 96 IBLA 61, 75-76 (1987). Redrawing the boundaries to the proper 40-acre subdivisions would not affect BLM's determination that the leased lands are within the KGS.